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ABSTRACT

A cross-cultural study examined preschoolers' knowledge of elementary components of the writing system. Subjects were 41 Chinese and 44 American preschool students between the ages of 2 and 4. The students were presented with sets of cards depicting familiar objects, capitalized English letters, and Chinese characters and were asked to turn each of the cards to the correct upright position. The cards were 3 inches square and could be placed in 1 of 4 orientations. It was theorized that the correct upright position for elemental writing units might be one of the first aspects of the writing system that children would learn and be able to demonstrate. It was found that the Chinese children were able to position the Chinese characters correctly with a frequency of 67 percent, while American children positioned the letters correctly with a frequency of 71 percent. The Chinese students were accurate 43 percent of the time in positioning English letters, suggesting the influence of the Roman alphabet in China, while, more surprisingly, the American students were accurate 34 percent of the time in positioning Chinese characters. The latter result may be due to the small size of the sample or to the fact that there is an internal logic to the correct orientation of Chinese characters apparent even to American preschoolers with no exposure to the language. (MDM)

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RESULTS FROM THE RIGHT SIDE UP TEST: A CROSS-CULTURAL STUDY OF YOUNG CHILDREN IN THE UNITED STATES AND CHINA

ED 366 443

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Purpose

This study was part of an ongoing series of investigations into the remarkable observational abilities of young children conducted in the United States and the People's Republic of China. The purpose was to study one micro feature of young children's earliest knowledge about literacy, specifically their knowledge of elementary components of the writing system.

Our previous investigations had indicated that very young children who had not yet received any formal literacy instruction had already begun to unravel fundamental aspects of their culture's writing system. We were interested in even earlier evidence of what young children might already know as a result of their own casual, informal noticing of the writing system.

In his book *The Emergence of Literacy,* Hall questions the validity of assumptions that are inherent to conventional literacy instruction:

> Children, from birth, are witness to both the existence of print and the relationship between print and people. It would seem strange, given the way that children involve themselves in all aspects of their world, if anyone suggested that there was one part of that visible world

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about which children were totally ignorant. Yet that is precisely the assumption that underpins so much conventional instruction. There has been almost universal acceptance that either children are ignorant about the nature and purpose of literacy unless they are "taught" it, or that what children know is of no importance whatsoever in devising teaching strategies. The overall effect of such views is that there has been a devaluation of children's competence, and an emphasis on direct instructional practices (Hall 1987, p. 2).

Ironically, as early as 1898 Harriet Iredell, an American school teacher, had recognized young children's emerging knowledge of literacy. Iredell wrote:

> It would seem that not only are the processes (of written and oral language) alike by their own nature but that the child in all cases where he has access to books and writing materials starts to take to reading and writing as he took to hearing language and talking, his progress being according to conditions furnished, in exceptional cases reaching fruition in the full ability to read and to write.
>
> Scribbling is to writing what babbling is to talking, preceding it, holding the same office of forming the organ, giving practice in shaping the elements. As a babbling child thinks he talks so the scribbling child thinks he writes. One is as natural to him, as universal, as much a part of his growth as the other. He needs no urging to practice either.
>
> We never cease to wonder at the extent and amount of knowledge accumulated during the first three years of life nor at the rate of development of the little creature.

> We say, 'Let this go on through the first years of school life and what may not be done.' But something bars the way. We are told, 'He must learn to read and write.' As if he had not already taken the first steps, and of his own volition, his efforts unrecognized for what they are (in Hall 1987, p. 4-5).

The purpose of our investigation was to recognize those efforts by studying one micro feature of children's knowledge in order to develop a more accurate profile of their early abilities, specifically with respect to the writing system.

Test Design

The Right Side Up Test was administered to 2 to 4 year old children to evaluate certain aspects of young children's early knowledge about two differing writing systems. The children were attending preschools in the United States and China, but they had not yet received any formal writing instruction at school.

The preschools were selected primarily as the organizations that were the most cooperative in facilitating our research. As such, the sample of preschool children included in this study were not intended necessarily to reflect an accurate representation of the entire population, but they were not exclusive types of schools; there were no special admissions policies and they made no special claims as to the abilities of the children in attendance. It's unlikely that the children who participated displayed abilities that are exceptionally rare or unusual.

The Right Side Up Test was designed to evaluate the visual awareness of writing among young children who might

not yet be ready to respond verbally to our inquiries. Although the test included verbal directions, it was designed not to require verbal directions. Each of the children was individually shown, one set at a time, 3 sets of different visual images that were printed on laminated 3" x 3" cards. The sets consisted of images of (1) familiar, non-culturally specific items (like a chair, or a bicycle); (2) capitalized Roman characters--English letters; and (3) Chinese characters, which were fairly common, but not characters for which young Chinese children would be likely to know the meanings. The images were presented flat on a table and at incorrect orientations with respect to the subject. The child was to turn each of the cards to the correct upright position, hence the name. We estimated that the correct upright position for elemental writing units might be one of the first aspects of the writing system that children would learn, and be able to demonstrate.

The set of pictures of familiar objects set was primarily to explain the directions. We wanted to establish that they understood what they were expected to do. If the scores for the pictures were high, the results would guarantee that the children understood their task. If the children had problems getting started we would turn one of the pictures to the correct position to demonstrate, and then try prompting the child to continue on their own. This procedure was demonstrated only with the set of pictures, and the demonstration examples were not included in the children's scores. Children who were unable to turn at least 3 pictures to the correct position on their own with repeated prompting and demonstrations were not included in the results. That didn't occur with any children over 2 years old.

Results

A total of 85 children from both countries were included in our study, 44 from the United States and 41 from China. The mean ages for the groups were 3.4 years old for the U.S. and 3.5 years old for the Chinese. On the picture section, which was given first, the U.S. children scored 94 percent accurate and the Chinese children scored 99+ percent. The slight drop in the U.S. children's score we concluded as related to the demonstration examples, which were excluded from their scores, indicating a small hesitation on their part to follow the verbal directions without actual demonstrations, especially when compared with the scores of the Chinese children. The results indicated that the children were able to complete the task correctly given the set of representational images--pictures--which were presumably more easily recognizable to very young children than abstract objects like symbolic elements of the writing system.

After the children's ability to carry out the directions was established, we next evaluated their knowledge of one elementary component within their own culture's writing system, i.e. the correct upright position of letters for U.S. children and of characters for Chinese children. But the letters and the characters were both given to every child because we had other interests as well. First, Chinese school children learn a phonetic form of written Chinese called pinyin that uses letters--Roman characters--and we wanted to see if their scores for that set would reflect that cultural familiarity with Roman characters; and secondly, we wanted to allow for the possibility that the orthography of a writing system follows an internal order, such that the correct spatial orientation of individual units is inherent in their visual structure, and therefore recognizable even to an outsider, given a certain

degree of knowledge regarding the operation of symbolic systems.

The Chinese children tested were able to position the characters correctly with a frequency of 67 percent, and the U.S. children positioned the letters correctly with a frequency of 71 percent. While researchers are unresolved as to the relative complexities and inherent difficulties regarding logographic writing systems, such as Chinese vs. alphabetic writing systems like English (Stevenson 1990, Rozin 1973), our contention is that the small discrepancy between the Chinese and US scores reflects the relative visual complexity inherent in the orthography of Chinese characters, of which there are literally thousands, *vis a vis* the 26 letters of the alphabet.

That the Chinese children scored 43 percent accurately with the letters was not surprising to find because of the use of Roman characters in the Chinese writing system called pinyin, mentioned above, and also because of the frequent use of English writing in China, much more common that the use of Chinese characters in the United States, which is rarely observed beyond their use in Chinese restaurants, or in designated areas like Chinatown, which every major city seems to have.

The implications are different for the U.S. children, who scored 34 percent accurately with the Chinese characters. There were 4 different orientations in which the characters could be placed, so there was a 25 percent random chance that the children could have placed the characters in the correct position by coincidence. There is also the possibility that the sample of children we used was not accurately representative of the population, and that by collecting more data the 9% difference beyond random chance, which was marginally significant to begin with, would disappear. Nevertheless,

although the sample of U.S. children was culturally diverse, they were less that 10 percent Asian American, so the children certainly didn't learn anything about the correct upright position for Chinese characters at home. Furthermore, none of the participating US preschools were located anywhere near Chinatown, and it's highly improbable that by 2 to 4 years old these children have eaten out at Chinese restaurants enough to have learned fundamental components of Chinese writing. Where could US children with little if any exposure to Chinese writing begin to learn the correct upright position for Chinese characters?

The 2 year old U.S. children scored 28 percent accurately on the Chinese characters, little better than random chance, but the 3 year old children scored 32 percent, and the 4 year old children scored 37 percent. Even if the youngest children's responses reflect random guesses, there is clearly a systematic improvement in the ability to respond accurately to the Right Side Up Test between the ages of 2 and 4 years old. It is unlikely that this is the result of an increased exposure to Chinese writing, brought on, for example, by a sudden appetite for Chinese cuisine. The most likely scenarios are that: (1) There is an internal logic to the correct orientation of Chinese characters that is contained within the visual structure of the characters themselves; or (2) There were some extraneous visual indicators of orientation contained in the particular reproductions we used, related to small variations in line widths, indicative of stroke directionality and consequently of character orientation. Neither scenario is counter indicated by the test results, which suggests a minor deficiency in this study, and an important consideration for future research.

Regardless of the limitations of this study, the results indicate a significant development in the ability of children in the United States to know the correct upright position of

Chinese characters, with which they are entirely unfamiliar, between the ages of 2 and 4. It is possible that the correct upright position for Chinese characters is carried within the character's abstract structure itself. That could indicate that the abilities involved in knowing the proper orientation for English letters also provide the skills for deciphering the correct upright position for Chinese characters. The other possibility is that the children had learned enough about the process of mark making through self-directed experimentation to recognize indicators of directionality contained within the strokes themselves. In that sense the strokes themselves carry an internal structure that can indicate the proper orientation, but then the internal structure is related to the process of forming the character, and not necessarily to an intrinsic balance within the abstract lines. In either scenario, the children's ability to process visual information in these ways is remarkable.

In addition to the primary objectives of this research there were a number of additional findings that are worthy of attention. Through a series of pre-tests we decided it was most effective to place the letters and the characters down one at a time so as not to create undue confusion, however, the set of 10 pictures were displayed simultaneously. The reason for this was that during the pre-tests a number of children were observed, without direction, to arrange the cards into linear rows, in the same way that units of writing systems are aligned in rows or columns. We were interested in the number of children that would automatically arrange even non-linguistic images like the pictures into rows and columns without being directed to do so. Fifteen of the 44 U.S. children, 34 percent, arranged the pictures into horizontal linear rows on their own initiative. Twenty four of the 41 Chinese children arranged the pictures into horizontal rows, and another 5 arranged them into vertical columns, for a total of 71 percent. This is probably

indicative of the rigorous organizational discipline and the attention to minute visual details evidenced by many Asian children (Stevenson, et al.). The children were neither instructed nor encouraged in this regard. Where else besides the writing system could even preliterate children have learned this linear organization of space?

Other observations include an unspecified number of children who spontaneously identified pictures, letters, or characters verbally, often indicating specific relationships such as letters used in their names or in their friend's names. The children offered this information voluntarily, and they were not prompted to do so in any way. Of the additional information that was volunteered by the children, not a single mistake was observed.

Conclusions

Although many literacy instruction curricula begin with the presupposition that children know nothing about reading and writing until they are taught, this study confirms the findings of a growing body of contemporary research into literacy development in young children by demonstrating a number of things that children know about writing systems before they ever receive formal language instruction.

Sulzby writes:

> One clear implication of all the research in emergent literacy is that children know far more than we acknowledged in our schools and instructional programs at the point when children begin formal schooling (Sulzby 1981, in Farr 1986, p. 196).

In order to be most effective educational curricula need to be founded on an accurate evaluation of students' abilities and knowledge. This study suggests important implications for the revision of many conventional literacy instruction curricula. More importantly, our research recognizes the remarkable abilities of young children spanning extremely diverse cultures and writing systems. The goal of this research is to help generate a more accurate profile of children's knowledge in order to facilitate educational development in ways that encourage children to recognize their own abilities, and eventually to realize their fullest potentials.

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